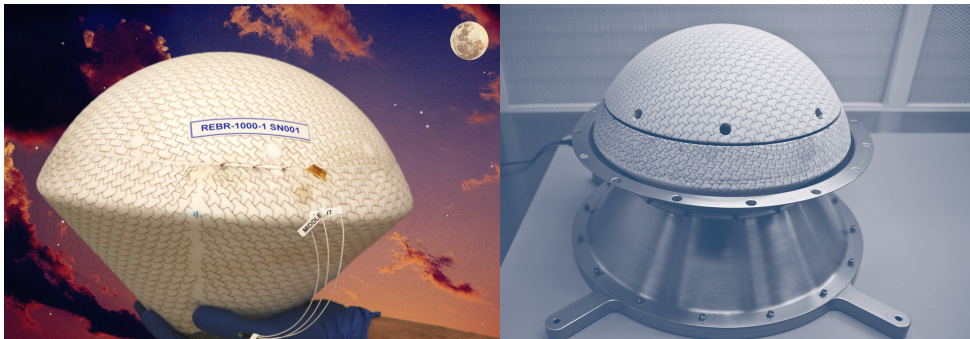


REENTRY BREAKUP RECORDER (REBR)



Overview

The Reentry Breakup Recorder (REBR) is a small, autonomous device that records temperature, acceleration, rotational rate, GPS, and other data during the reentry of space hardware into the Earth's atmosphere and its subsequent breakup due to aerodynamic heating and loads. The REBR includes a heat shield that protects the instrument and its recorded data from the severe reentry heating environment. REBR is designed to be released from the reentering host vehicle during the breakup process, to fly free and reach a subsonic, free-fall velocity at about 18 km (60,000 feet) altitude, and to "phone home" recorded data via the Iridium network before Earth impact. Recovery of the device is not required.

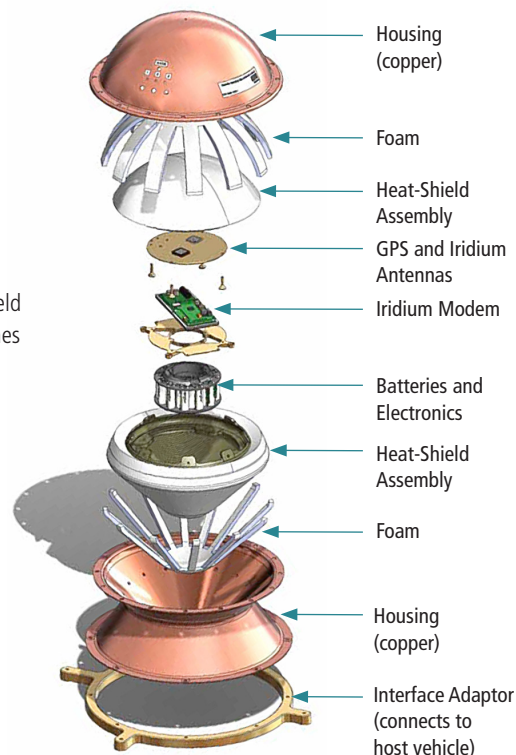
REBR was designed and fabricated by The Aerospace Corporation with major funding provided by Aerospace, the U.S. Air Force, and NASA Goddard Space Flight Center. The heat shield was provided by The Boeing Company. NASA Ames Research Center provided in-kind support of the heat shield design.

Housing

REBR is contained within a housing that attaches to the host vehicle. On its first flight, the housing was copper and was designed to release REBR as the temperature of the housing increased.

Activation

Prior to its first flight back to Earth, astronauts on the International Space Station will activate REBR sensors, which then look for acceleration rates characteristic of reentry. Once reentry is detected, the data recorder collects data from all sensors. After release from the host vehicle, REBR slows to a subsonic velocity, activates the Iridium modem, and transmits recorded data to an Iridium satellite, which relays data home.



First Flight Tests

In January 2011, two REBRs were carried to the International Space Station on the Japanese HTV-2 supply vehicle. One REBR will remain on HTV-2, which will reenter two months later; astronauts will move the second to the European ATV-2 vehicle, which will reenter in mid-2011. REBR's first flight test was integrated and flown under the direction of the Department of Defense's Space Test Program.

REBR Facts

Mass (REBR alone)	4 kg (9 lb)
Mass (REBR plus Housing)	8.6 kg (19 lb)
Dimensions (REBR alone)	30 cm diameter, 23 cm high (12 in diameter, 9 in high)
Dimensions (REBR plus Housing)	36 cm diameter, 28 cm high (14 in diameter, 11 in high)



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